

REMARKS

Claims 1, 3-12, 14-19, 21-34, and 36-43 are pending in this application after entry of this response. Claims 2, 13, 20 and 35 have been cancelled. Claims 42 and 43 are new. No new matter has been added.

Amendments to the Claims

Claim 1 has been amended to specify that the apparatus is a flow control insert and that the conduit is a downhole conduit. Basis for these amendments can be found in Fig 1, and page 15, lines 18 to 19 of the PCT application as filed, which shows and describes that the cement tools are located inside a length of casing.

Claim 1 has also been amended to specify that the decelerating means comprises a passage, which includes at least one spiral portion. Basis for this amendment can be found in original claims 2 and 20, which have consequently been cancelled.

Claim 1 has also been amended to specify that the passage has an axial portion at each of its ends. Basis for this amendment can be found in the paragraph spanning pages 16 and 17 of the PCT application as filed and in Fig 1 and Figs 5 to 9 (the axial passages 88, 89).

Claims 3 to 12, 14 to 19 and 21 to 28, have been amended in consistency with the amendments to claim 1, and now commence: "A flow control insert...".

Claim 13 has been cancelled.

Some claim dependencies have been consequently amended and corrected. Some claims have been re-written for clarity, and to avoid confusion over the claim dependencies. In particular, the format of some claims "as claimed in claim X when dependent on claim Y" has been removed in order to enhance the clarity of the claims.

Claim 29 has been amended to specify that the conduit is a downhole conduit. Basis for this amendment can be found in page 15, lines 18 to 19 of the PCT application as filed, in which the conduit is a length of casing.

Claim 29 has also been amended to specify that the decelerating means comprises a passage which includes at least one spiral portion. Basis for this amendment can be found in original claims 2 and 20.

Claim 31 has been amended to specify that the fluid is decelerated through a decelerating means positioned within the downhole conduit. Basis for this amendment can be found in claim 1 of the PCT application as filed.

Claim 31 has also been amended to specify that the decelerating means causes the fluid to change direction from an axial direction to a spiral direction and back to the axial direction. Basis for this amendment can be found in original claim 35, Fig 1 and Figs 5 to 9; in the paragraph spanning pages 16 and 17, and in page 17, lines 21 to 23 of the PCT application as filed.

Claim 35 has been cancelled.

New claim 42 has been added. New claim 42 finds basis in original claim 4, which has been rewritten in independent form and which includes all the limitations of claim 1 and the intervening claims 2 and 3. Claim 42 also specifies that the passage includes at least one spiral portion and an axial portion at each of its ends. Basis for these features can be found in original claim 20, the paragraph spanning pages 16 and 17 (the axial passages 88, 89) and in Fig 1 and Figs 5 to 9 of the PCT application as filed.

New claim 43 has been added. New claim 43 is similar to claim 1 and also specifies that the flow control insert is located in a downhole conduit which includes a shoe at a lower end thereof. Basis for these features can be found in original claim 4 and in Fig 1.

It is respectfully submitted that no new matter has been added by means of the above claim amendments.

**35 USC 112 Claim rejections**

Claims 13 and 27 were rejected under 35 USC §112.

Claim 13 has been cancelled.

Claim 27 has been amended to remove the wording "when dependent on claim 23", as requested by the Examiner.

Reconsideration and withdrawal of the rejection of claim 27 is respectfully requested.

**35 USC 102 Rejections in view of Weingarten (US 5,570,744)**

Claims 1-3, 14-20, 26, 28 and 31-36 were objected to under 35 USC 102(b) as being anticipated by Weingarten.

Claim 1 has now been amended to specify the flow control insert is adapted to be positioned within a downhole conduit.

In contrast, Weingarten discloses a separator 16, which is located externally of wells 10, 12 and 34 (see Fig 1). Recovered fluids from wells 10 and 12 enter an inlet of the separator 16, which separates a liquid component from a gas component. The liquids leave via flowpath 20, whilst the gases leave via flowpath 18. Hence, Weingarten's separator is used externally of a well, and is not a flow control insert for positioning within a downhole conduit.

Hence, amended claim 1 is novel over Weingarten.

**Inventive Step of amended claim 1**

A technical advantage of a flow control insert of amended claim 1, is that it can be used to control the flow of fluid through a downhole conduit.

For example, the application in suit describes a use of the flow control insert, in which the flow control insert is located within a casing string, and is connected to a shoe. Drilling mud and cement both pass through the casing string, through the flow control insert, out of apertures in the shoe, and into the borehole. The cement follows the drilling mud down the casing string, and accelerates the drilling mud, because the cement is very much heavier than the drilling mud, and is falling under gravity. As explained in the paragraph spanning pages 23 and 24 of the present application, when the drilling mud is accelerated by the cement, turbulence is created in the flow control insert, which decelerates the drilling mud. The reduction in speed of the drilling mud eases the pressure on the formation, rendering the formation less likely to collapse (see page 30, lines 18 to 23 of the PCT application as filed). The flow control insert will also reduce the speed of the cement.

In contrast, Weingarten's separator is for a completely different purpose. Weingarten takes fluids which have been recovered from a well, and separates them into gas and liquid components.

The purpose of Weingarten's helical baffle 58 is to achieve this separation using centrifugal forces; the gases will stay closer to the central hub 66, whilst the liquids will be at the periphery. Thus, arranging respective outlets at the central hub 66 and the periphery, will collect these gas and liquid components separately.

Hence, Weingarten's separator was not designed with the aim of decelerating fluids. All that Weingarten is trying to achieve by the helical baffles is a separation, based on radius, of liquids and gases.

Weingarten's separator could not be used downhole because the helical baffle 58 is only designed to carry the much lighter recovered gases and liquids. Placing Weingarten's separator into a borehole and trying to run cement, which is very heavy and which has already fallen a large distance under the force of gravity, though it would certainly break the helical baffles provided by Weingarten.

Furthermore, a skilled person would never consider using Weingarten's separator downhole, because that would block the passage of all fluids into and out of the well. Instead, the skilled person would be much more likely to use Weingarten's separator as taught by Weingarten:

outside of the well, where the liquids and gases to be separated (and these fluids only) can be especially diverted into this apparatus.

Also, locating the separator downhole requires additional downhole pipework, for the two outlet flowpaths (the gas flowpath and the liquid flowpath) which must leave the separator. This would be overly complex to install, and the requirement for two outlet conduits (to carry the recovered, separated liquids separately from the recovered, separated gases) instead of a single conduit for all recovered fluids, would significantly reduce the useful working volume of the downhole conduit, without providing any compensating advantage.

Additionally, it would be illogical to locate a separator for recovered fluids downhole, where it is inaccessible for maintenance and repair. The pressure in wells can be immense, and removing the tree cap on a regular basis to access the separator 16 for maintenance would be time-consuming (hence very expensive) and highly risky, as each removal of the tree cap risks a blow-out. As such, locating Weingarten's separator 16 downhole would be totally undesirable and contrary to accepted wisdom of those skilled person in the art .

Hence, the skilled person, learning of Weingarten's separator for removing gases from other recovered fluids, would never seek to adapt that device to locate it downhole, and in any event, could never use it as a decelerator for fluids such as cement and drilling mud. Such a modified apparatus would obstruct entry and exit of every fluid to be injected into or recovered from the well, the separator would not be readily accessible and indeed could not be accessed without risk, the helical baffles would break under the weight of any cement injected into the well, and the useable volume within the downhole conduit would be severely reduced (with no compensating advantage) through having two recovery conduits leading from the separator, instead of one.

There is no hint, suggestion or teaching in Weingarten to modify the Weingarten separator (designed for separating recovered well fluids into liquids and gases), for use in decelerating fluids through a downhole conduit. There is also no teaching of the desirability to decelerate any fluids, as opposed to the stated aim of Weingarten of separating fluids. Neither the desirability of decelerating fluids (e.g. drilling mud), nor the problem of reducing the pressure on the formation are recognised in Weingarten.

Hence, amended claim 1 is inventive over Weingarten.

Reconsideration and withdrawal of the objection to claim 1 is respectfully requested.

Apparatus claims 3 to 12, 14 to 19 and 23 to 30

Apparatus claims 3 to 12, 14 to 19 and 23 to 28 are all dependent on claim 1, and are thus also novel and inventive for the same reasons as claim 1. Apparatus claims 29 and 30 share the novel and inventive feature of claim 1, that the flow control insert is adapted to be positioned in a downhole conduit. Hence, these claims are also novel and inventive, for the same reasons as claim 1.

Method claim 31

Method claim 31 now specifies a method of controlling the passage of fluid through a downhole conduit. In contrast, Weingarten is only concerned with separating recovered well fluids. Hence, claim 31 is novel and inventive, for the same reasons as claim 1.

Method claims 32 to 34 and 36 to 41

Method claims 32 to 34 and 36 to 41 are all dependent on claim 31, and are hence also novel and inventive, for the same reasons as claim 31.

**35 USC 103 Rejections in view of Weingarten (US 5,570,744)**

Claims 21 and 22 were rejected under 35 USC 103(a) as being unpatentable over Weingarten.

As explained above, amended claim 1 is novel and inventive over Weingarten. Claims 21 and 22 are both dependent on claim 1 and, as such, these claims are also novel and inventive, at least by virtue of this dependency.

Reconsideration and withdrawal of the objections to claims 21 and 22 is respectfully requested.

### **New Claims**

#### **New claim 42**

The applicant appreciates the Examiner's confirmation that claim 4 would be allowable if re-written in independent form and including all the limitations of the base claim and any intervening claims. Prior pending claim has been written as new independent claim 42, and comprises a combination of original claims 1 to 4, including the intervening claims. Hence, it is thus believed that claim 42 is acceptable for grant.

#### **New claim 43**

New claim 43 is similar to claim 1, and in particular shares its novel and inventive features. Hence, claim 43 is novel and inventive for the same reasons as given for claim 1.

### **Consideration of Previously Submitted Information Disclosure Statement**

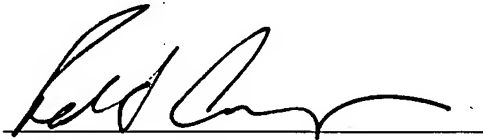
Applicants submitted a Supplemental Information Disclosure Statement and PTO 1449 form on August 25, 2005. The Office Action did not acknowledge whether that Supplemental Information Disclosure Statement has been entered and considered. Attached as Exhibit A is a copy of the previously filed Supplemental Information Disclosure Statement dated August 25, 2005, along with a confirmation postcard indicated receipt by OPIE on August 30, 2005. A copy of the non-patent prior art also is included. According to the USPTO's PAIR system, the Supplemental Information Disclosure Statement was received. See Exhibit B. Accordingly, the prior Supplemental Information Disclosure Statement was timely filed.

Entry and consideration of the Supplemental Information Disclosure Statement is respectfully requested in this application.

**Request for Allowance**

It is thus believed that the application is now allowable and notification to this effect is earnestly solicited. Should the Examiner have any questions or comments regarding Applicants' amendments or response, he is asked to contact Applicants' undersigned representative at (215) 988.3303. Please direct all correspondence to the below-listed address. If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0573.

Respectfully submitted,



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